PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Robert M. France	Confirmation No.	5773
Serial No.:	10/777,391		
Filed:	February 12, 2004	Customer No.:	72689
Examiner:	Andrew Lai		
Group Art Unit:	2416		
Docket No.:	1014-076US01/JNP-0326		
Title:	PACKET FORWARDING USING INTERMEDIATE POLICY INFORMATION		

RESPONSE

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed January 7, 2009, the period of response for which runs through April 7, 2009 and has been extended by one month to May 7, 2009, please amend the application as follows.

Remarks begin on page 2 of this paper.

REMARKS

The following remarks are responsive to the Office Action dated January 7, 2009. Applicant has elected not to amend any of the claims. Claims 1-37 and 39 are pending.

Claim Rejection Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 1-23, 25-37 and 39 under 35 U.S.C. 103(a) as being unpatentable over Kuhl et al. (US 2003/0118026) in view of Callon et al. (US 5,251,205) and further in view of Raychaudhuri et al. (US 5,684,791). Applicant respectfully traverses the rejection. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested a rational reason to arrive at the claimed invention.

For example, the applied references fail to teach or suggest a method comprising receiving, with a network device that supports at least three network protocols, a packet containing a first class of service (CoS) information, wherein the first CoS information specifies a class of service for the packet in a format that conforms to a first of the at least three supported network protocols used within a network and storing, within the network device, intermediate CoS information that provides a universal classification mechanism independent of: (i) any layer two protocols used within the network, and (ii) protocols of layers on top of layer two protocols used within the network, as required by Applicant's previously presented claim 1.

The applied references also fail to teach or suggest accessing the first CoS information within the packet to determine the class of service for the packet, mapping the first CoS information to the intermediate CoS information based on the class of service determined for the packet and mapping the intermediate CoS information to a second CoS information, wherein the second CoS information specifies the class of service for the packet in a format that conforms to a second of the at least three supported network protocols used within the network, as further required by Applicant's claim 1.

The applied references further fail to teach or suggest outputting the packet with the network device to forward the packet within the network in accordance with the second network protocol, the packet containing the second CoS information that specifies the class of service information for the packet in accordance the second network protocol, again as required by Applicant's claim 1.

Particularly, the applied references lack any teaching to suggest accessing the first CoS information ***within the packet*** to determine the class of service for the packet, mapping the first CoS information to the intermediate CoS information based on the class of service determined for the packet, and mapping the intermediate CoS information to a second CoS information, wherein the second CoS information specifies the class of service ***for the packet*** in a format that conforms to a second of the at least three supported network protocols used within the network, as required by Applicant's claim 1. In other words, Applicant's invention as set forth in the claims maps first CoS information within a packet to intermediate CoS information and then maps the intermediate CoS information to second CoS information for the packet in a format that conforms to a second of the at least three supported network protocols.

Yet, the primary reference relied on by the Examiner, i.e., the Kuhl reference, relies on a ***direct*** mapping from what the Examiner refers to as a partial class of service bit in the ATM header, i.e., the CLP bit, ***directly*** to the MPLS EXP bits.[1] That is, the ATM CLP bit is not mapped to the intermediate CoS information and instead is explicitly preserved by the Kuhl edge router for use in accessing the table shown in FIG. 7 of Kuhl. A portion of Kuhl's FIG. 6 is reproduced below for the Examiner's convenience and to facilitate comparison with Applicant's claimed invention.

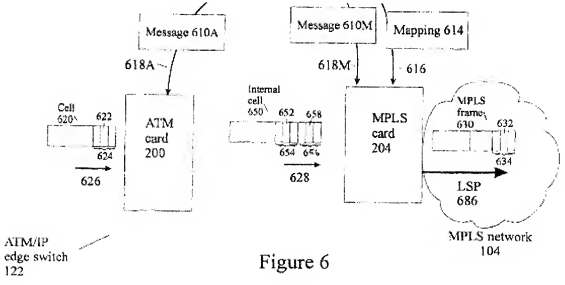


Figure 6

[1] FIGS. 7.

This reproduced portion of Kuhl's FIG. 6 shows ATM card 200 receiving an ATM cell 620 having an ATM header 624 that includes CLP bit 622.[2] Shown leaving ATM card 200 is an internal cell 650 having two headers, header 654 that ***includes*** CLP bit 652 and an internal header 656 that includes connection identifier field 658, where the connection identifier field indicates the class of service.[3] Based on connection identifier field 658 ***and*** CLP bit 652, MPLS card 204 determines the value for the EXP bit in accordance with mapping 614, where one example of mapping 614 is provided in table 700 of FIG. 7.[4]

According to Kuhl, what is mapped to intermediate CoS information are the ***connection*** parameters and not the CoS information within the packet, as required by Applicant's claim. Instead, the Kuhl preservses the ATM CoS information within ATM cell 620 and directly maps that to MPLS EXP bits, which is entirely counter to Applicant's invention. Thus, Kuhl does not address the problems solved by Applicant's invention and instead suffers from the same problems identified in Applicant's Background. FIG. 5 of Kuhl shows a table that maps the connection characteristics or parameters to the intermediate class of service. Kuhl matches these connection parameters to the intermediate class of service information because these connection parameters are **not** included within the header of every ATM cell. Instead, as noted by the Examiner, a different cell includes these connection parameters. Rather than attach these connection parameters to each subsequent cell before sending the cell to MPL card 204, the Kuhl edge router condenses these connection parameters to an intermediate class of service.

In this respect, Kuhl teaches to mapping connection-level information to intermediate class of service information, not to accessing the first CoS information ***within the packet*** to determine the class of service ***for that same packet*** and mapping the first CoS information to the intermediate CoS information based on the class of service determined for the packet, as required by Applicant's claim 1. Moreover, Kuhl teaches to accessing the first CoS information within the packet, e.g., the CLP bit of the ATM header for each cell, and preserving this CLP bit for use in ***directly*** mapping the CLP bit to particular MPLS EXP bits. Again, this Kuhl teaching does not even so much as suggest mapping the first CoS information to the intermediate CoS information based on the class of service determined for the packet, as required by Applicant's

[2] *See also* ¶ [0065].
[3] *See also* ¶'s [0065] and [0075].
[4] ¶'s [0072] and [0077].

claim 1. Rather, Kuhl teaches away from mapping the CLP bit of the ATM header for each cell to the class of service and instead teaches to preserving this bit for later use.

As a result, Applicant submits that Kuhl lacks any teaching to suggest storing, within the network device, intermediate CoS information that provides a ***universal*** classification mechanism independent of: (i) any layer two protocols used within the network, and (ii) protocols of layers on top of layer two protocols used within the network, as required by Applicant's claim 1. Looking to the above Kuhl teachings, it is clear that these teachings inextricably tie the intermediate class of service information to ATM, as the mapping shown in FIG. 5 of Kuhl maps specific ATM connection parameters to a particular classes of service. Moreover, as the Kuhl mapping shown in FIG. 7 depends on the CLP bit, this mapping is specific to ATM as well. In this sense, the Kuhl teachings provide a mapping that maps the CLP bit of ATM headers ***directly*** to the EXP bits of MPLS headers. In no sense does Kuhl provide any teaching to suggest storing, within the network device, intermediate CoS information that provides a ***universal*** classification mechanism independent of: (i) any layer two protocols used within the network, and (ii) protocols of layers on top of layer two protocols used within the network, as required by Applicant's claim 1.

In fact, Applicant notes that this direct mapping suffers from the very deficiencies described in background paragraphs [0006] and [0007] of Applicant's specification. Particularly, paragraph [0006] of Applicant's specification provides that "network devices, such as routers, often employ complex mapping techniques to ***preserve*** CoS information when packets are forwarded from one forwarding domain to another, i.e., from one protocol to another." (Emphasis added.) Also, paragraph [0007] suggests that "these mapping techniques typically require a unique mapping between every combination of protocols supported by the network device in order to ensure that CoS information can be correctly conveyed as packets are forwarded between the protocols." Kuhl both preserves the ATM CLP bit and provides a direct mapping between the CLP bit and the MPLS EXP bits and as a result "the number and complexity of these protocol mappings ... increases substantially as the number of protocols supported by a network device increase."[5] Applicant's invention overcomes this known deficiency by providing the above described universal classification mechanism.

[5] Applicant's specification ¶ [0007].

The Examiner apparently overlooks this direct mapping when applying Kuhl and even when responding to Applicant's arguments. In responding to Applicant's arguments regarding the "within the packet" claim limitation, the Examiner provides three alternatives. In the first alternative labeled "A.," the Examiner states that Kuhl teaches to embedded CLP bits in ATM cells and that these CLP bits may be used as a partial CoS indicator to when mapping it to an EXP value in MPLS frames. Here, the Examiner alludes to the fact that Kuhl teaches to mapping the CLP bits directly to the EXP bits, but overlooks the fact that Applicant's claimed invention would require mapping the CLP bits to the intermediate class of service information. As described above, Kuhl lacks any teaching to suggest mapping first CoS information determined from wihtin the packet to intermediate CoS information.

In the second alternative labeled "B.," the Examiner suggests that Applicant's own specification admits that CoS information may be included within the packet. The Examiner then concludes that "This would also make it obvious to one skilled in the art to modify Kuhl to have CoS embedded 'within the header information associated with each packet'." Whether true or not, this does not change the fact that Kuhl teaches to a direct mapping between the CLP bit and the EXP bits as shown above. Kuhl, as shown above, suffers from the very deficiencies noted in Applicant's specification that result from the fact that Kuhl provides a direct mapping, not that Kuhl lacks any clear teaching directed to CoS information within the packet. The Examiner again overlooks that Kuhl teaches to a direct mapping from ATM CLP bits to MPLS EXP bits.

In the third alternative labeled "C.," the Examiner refers first to Kilkki to suggest that the CLP bits does represent CoS information within the packet and second to Raychaudhuri to suggest that ATM cells may include CoS information within the header. Again, whether true or not, neither of these references overcome the deficiencies noted above with respect to the Kuhl direct mapping. Suggesting the CLP bit is in fact CoS information does not overcome the teaching of Kuhl regarding the mapping of the CLP bit ***directly*** to the MPLS EXP bits. Moreover, the Examiner's suggestion of adding additional bits to the ATM header in reference to Raychaudhuri does not somehow modify Kuhl in a manner such that the combination teaches anything other than directly mapping these bits of the modified ATM header ***directly*** to the MPLS EXP bits. Once again, the Examiner overlooks that Kuhl teaches to a direct mapping from ATM CLP bits to MPLS EXP bits.

Applicant also notes that Kuhl provides for a direct mapping of MPLS EXP bits directly to ATM CLP bits. For example, paragraph [0092] of Kuhl provides that "The drop precedence of cell 300 is converted from header 316 of MPLS frame 312 to form CLP bit 355 of internal cell 350 which is then mapped to CLP bit 305 of cell 300." Clearly, even in reverse or when going from MPLS EXP bits to ATM CLP bits, Kuhl provides for a direct mapping from EXP bits directly to ATM CLP bits.

The remaining applied references, Callon and Raychaudhuri, do not overcome the deficiencies noted above with respect to Kuhl. The Examiner relies on Callon to teach or suggest a method/device/system that supports at least three or more network protocols. Yet, none of the portions of Callon cited by the Examiner overcome the teachings of Kuhl regarding a direct mapping. As described above, Raychaudhuri also does not overcome the deficiencies of Kuhl noted above.

The arguments made above with respect to independent claim 1 apply to independent claims 15, 26, 29 and 34 to the extent these claims recite similar limitations to those of claim 1. Moreover, the arguments made above with respect to these independent claims apply to claims 2-14, 16-23, 25, 27, 28, 30-33, 35-37 and 39 by virtue of claims 2-14, 16-23, 25, 27, 28, 30-33, 35-37 and 39 depending from independent claims 1, 15, 26, 29 and 34 respectively. Accordingly, the applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested a rational reason to arrive at the claimed invention.

In the Office Action, the Examiner rejected claim 24 under 35 U.S.C. 103(a) as being unpatentable over Kuhl in view of Callon and Raychaudhuri and further in view of Hughes et al. (US 6,434,612). Applicant respectfully traverses the rejection. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested a rational reason to arrive at the claimed invention.

Specifically, the additional reference cited by the Examiner, i.e., the Hughes reference, does not overcome the deficiencies noted above with respect to claim 1. The Examiner cited Hughes as teaching to a logical interface. However, the portions of Hughes cited by the Examiner do not overcome the deficiencies of the other applied references, as noted above. Consequently, the applied references fail to disclose or suggest the inventions defined by

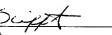
Applicant's claims and provide no teaching that would have suggested a rational reason to arrive at the claimed invention.

For at least these reasons, the Examiner has failed to establish a prima facie case for non-patentability of Applicant's claims 1-37 and 39 under 35 U.S.C. 103(a). Withdrawal of these rejections is requested.

CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date: May 4, 2009

By: 

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